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REVIEWS BOOK ON MUTABILITY OF BACTERIA

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[This is a review of Trudy Konferentsii institutov Epidemiologii i Mikrobiologii po Probleme Izmenchivosti Mikrobov (Works of the Conference of the Institutes of Epidemiology and Microbiology on the Problem of the Mutability of Bacteria), Gor'kiy, 25 - 28 November 1948. The book was published by the Gor'kiy Institute of Epidemiology and Microbiology, 1949, 232 pp, price 12 rubles; 1,500 copies of this edition have been published.]

Soviet investigators have always paid much attention to problems connected with the mutability of bacteria. Work in this field was expanded after the historic session of VASKhNIL (All-Union Academy of Agricultural Sciences imeni V. I. Lenin). The conference and this book summarize the results obtained hitherto. The results reported below deal with the mutability of pathogenic bacteria only: the fields of general and agricultural microbiology have not been considered.

In the Gor'kiy conference, 263 people from 27 cities of the USSR participated; 21 institutes of epidemiology and microbiology, 9 other institutes, 20 university chairs, and 10 sanitary-bacteriological laboratories were represented. The papers presented at the meeting can be divided into three groups: (1) relationships pertaining to the process of mutation and the role played by the mutability of bacteria in infections and epidemics; (2) questions connected with the etiology of some infectious diseases (epidemic typhus, scarlet fever, influenza); nature of the bacteriophage; development of bacteria by stages; and (3) mutability of the causative factors of tuberculosis and diphtheria; the nature of the phenomenon of dissociation of bacteria.

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The volume contains all the papers presented at the meeting with the exception of a long report by Professor V. A. Ryazanov entitled "On the Results of the August Session of VASKhNIL and Tasks of the Ministry of Public Health of the RSFSR in Connection With the Direction of Pedagogic and Scientific Work in the Field of Biological Sciences at Medical and Scientific Institutions." The papers published in this volume are very interesting. An insufficient contact of the medical microbiologists with biological science is noticeable, however, so that the richness of facts and ideas contributed by Michurinist biology has not been fully utilized by some of the authors. Professor F. T. Grinbaum's report "Problem of the Mutation of Bacteria" is the one which is least open to criticism from this viewpoint. It is regrettable that not a single report dealing with the evolution of bacteria and infectious diseases was presented. As a result, the problem of the mutability of bacteria was discussed apart from the problem of evolution in the wider biological sense.

Of particular interest are the following reports presented by Professor V. A. Krestovnikova and collaborators: "Problems of the Etiology of Infections in Dependence on the Stage of Development of the Causative Factor," "Problem of the Connection Between Provachak's Rickettsia \sqrt{R} provazeki provazeki and Proteus X," and "Problem of the Nature of Bacteriophage"; and the following reports by Professor L. I. Fal'kovich and collaborators: "Problem of the Etiology of Scarlet Fever" and "Interdependence Between Influenza Virus and Pfeiffer's Bacilli." The work listed in this paragraph was carried out over a number of years at the Moscow Institute of Infectious Diseases imeni I. I. Mechnikov and is being continued there at present.

In addition to reporting extensive experimental data, the authors expressed interesting and fresh ideas on such involved questions as the etiology of scarlet fever or influenza. Thus, L. I. Fal'kovich succeeded in isolating from scarlet fever substrates (throat smears, blood, and urine) a filterable agent which, in her opinion, is apparently not an independent virus, but a virus stage of the streptococcus, or in other words a streptococcal virus. The view was advanced that precisely this stage must be regarded as the cause of the pathogenesis of scarlet fever. A similar idea was expressed by V. A. Krestovnikova with reference to typhus. In accordance with the opinion held earlier by N. F. Gamalaya, she assumes that Rickettsia are a parasitic stage of Proteus X, which in the course of evolution have become adapted to life in the organism of humans and of the louse.

The question as to whether the virus, the Afanas'yev-Pfeiffer bacillus, or the bacillus in combination with the virus is the causative factor of influenza has been discussed for a long time. Professor Fal'kovich established that there is a profound similarity between the virus and the Afanas'yev-Pfeiffer bacillus as far as antigenic effects are concerned. She suggests on the basis of this finding that there may be a genetic relationship between the two microorganisms. In her opinion, it is possible that at some stage of evolution the influenza virus separated from the Pfeiffer bacillus and represents a special modification of this microorganism, or that the influenza virus is merely a virus stage of the bacillus. This viewpoint opens new perspectives for the study of influenza and the fight against that disease.

The existence of several stages of microorganisms is being discussed with increasing frequency in Soviet scientific literature. This problem forms the subject of increasingly extensive investigations at various USSR microbiological laboratories. This situation has been reflected on the work of the conference on mutability. The hypothesis that bacteria pass through several stages in the course of their development was clearly expressed for the first time by M. D. Uténkov before the war (of his monograph "Microgeneration" published in 1940). Unfortunately, neither the results of Uténkov nor those of G. M. Bosh'yan, who did recent work on the subject, were presented or discussed in any manner at the conference.

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In addition to Grinbaum's report mentioned above, the following two papers deserve attention: "Some Data on the Mutability of Bacteria and Their Practical Significance," by Professor G. V. Vygodchinov, and "Effect of the Mutability of Bacteria on the Microbiological Diagnosis of Infectious and Epidemic Processes," by Professor F. G. Berngof. The work of the conference indicates that USSR microbiology is developing successfully on the basis of Marxist-Leninist ideology and of Michurin's teaching. In view of the fact that work on the mutability and evolution of microorganisms is developing on an extensive scale, further conferences of this type should be called in the future and their program expanded so that biologists who are active in various specialized fields will participate.

The direction which future work will take is indicated by the conference resolution, which, in addition to naming other fields that are open to investigation, listed the following problems: study and fixation of characteristics which identify the species of bacteria; investigation of the role which the mutability of bacteria plays in the pathogenesis and clinical aspects of diseases; and investigation of the modification of properties of bacteria in the course of epidemics.

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